

AMENDMENTS TO THE CLAIMS

Claim 1 (Cancelled)

2. (Previously Presented) The process for producing a solid catalyst component according to claim 48 wherein the activated particulate silica used in step (a) is a microspheroidal, porous silica.

3. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the activated particulate silica used in step (a) has an average particle size ranging from 10 to 120 nm.

4. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the activated particulate silica used in step (a) has a surface area ranging from 250 to 500 m²/g.

5. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the activated particulate silica used in step (a) has a pore volume ranging from 1.0 to 2.0 ml/g.

6. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the organometallic compounds of groups 1, 2, 12 or 13 of the periodic table used in step (a) are selected from the

group consisting of trimethylaluminum, triethylaluminum (TEAL), methylaluminum dichloride, methylaluminum sesquichloride, isobutylaluminum dichloride, isobutylaluminum sesquichloride, ethylaluminum dichloride (EADC), diethylaluminum chloride (DEAC), ethylaluminum sesquichloride (EASC), tri-n-hexylaluminum (Tn-HAL), tri-n-octylaluminum (TnOAL), butyl ethylmagnesium (BEM), butyl octylmagnesium (BOMAG), methylmagnesium chloride and ethylmagnesium chloride.

7. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the magnesium compound used to prepare the solution in step (c) is selected from the group consisting of magnesium dichloride, magnesium diethylate, magnesium di-n-butylate, magnesium diisopropylate and magnesium diisobutylate.

Claim 8 (Cancelled)

9. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the titanium compound used to prepare the solution of the step (c) is selected from the group consisting of titanium tetra-n-propylate, titanium tetra-n-butylate, titanium tetra-i-propylate, titanium tetra-i-butylate or the corresponding titanium mono- or di-chloroalkoxides.

Claim 10 (Cancelled)

11. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the molar ratio Ti/Mg used to prepare the solution of the step (c) is between 0.3 and 4.

12. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the reducing agent used in the step (e) is a Na-alkyl, a Li-alkyl, a Zn-alkyl, a Mg-alkyl and corresponding aryl-derivatives, and compounds of the type RMgX wherein R represents linear or branched alkyl groups containing 1 to 10 carbons or alkyl-derivatives and X is a halogen atom.

13. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the reducing agent used in the step (e) is (CH₃)₃SiO[(CH₃)HSiO]_nSi(CH₃)₃, (CH₃HSiO)₄, (CH₃HSiO)₃, H₃Si-O-SiH₂-OSiH₃ or phenylhydropolysiloxanes in which the hydrogen atoms can be partially replaced by methyl Groups and n is the degree of polymerization that ranges from 5 to 100.

Claim 14 (Cancelled)

15. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the halogenating agent used in the step (f) is selected from the group consisting of methylaluminum dichloride, methylaluminum sesquichloride, isobutylaluminum dichloride, isobutylaluminum sesquichloride, ethylaluminum dichloride (EADC), diethylaluminum chloride

(DEAC), ethylaluminum sesquichloride (EASC), SiCl_4 , SnCl_4 , HCl , Cl_2 , HSiCl_3 , aluminum chloride, ethylboron dichloride, boron chloride, diethylboron chloride, HCCl_3 , PCl_3 , POCl_3 , acetyl chloride, thionyl chloride, methyl trichlorosilane, dimethyl dichlorosilane, TiCl_4 , VCl_4 , CCl_4 , t-butyl chloride, n-butyl chloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane and dichloromethane.

Claim 16 (Cancelled)

17. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the thermal treatment of step (g) is conducted from 0.5 hour to 5 hours and at a temperature from 60°C to 120°C.

18. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein two different organometallic compounds are used in step (i) to wash the solid obtained in step (h).

19. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein more than one of the organometallic compounds in the step (i) are fed together, mixed in the same solution.

20. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein more than one of the organometallic compounds in step (i) are fed together, in individual solutions.

21. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein more than one of the organometallic compounds in step (i) are fed one after the other, in individual solutions.

22. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the organometallic compound used in step (i) is selected from the group consisting of methylaluminum dichloride, methylaluminum sesquichloride, isobutylaluminum dichloride, isobutylaluminum sesquichloride, ethylaluminum dichloride (EADC), diethylaluminum chloride (DEAC), ethylaluminum sesquichloride (EASC), tri-n-hexylaluminum (Tn-HAL) and tri-n-octylaluminum (TnOAL).

23. (Previously Presented) The process for producing a solid catalyst component according to claim 48, wherein the inert organic solvent of step (a) is selected from the group consisting of hexane, heptane, octane or isoparaffin.

Claim 24 (Cancelled)

25. (Previously Presented) The solid catalyst component according to claim 50, wherein the solid catalyst component morphology is spheroidal.

26. (Previously Presented) The solid catalyst component according to claim 50, wherein the solid catalyst component has an average particle size ranging from 10 to 120 μm .

27. (Previously Presented) The solid catalyst component according to claim 50, wherein the solid catalyst component has a surface area ranging from 80 to 300 m^2/g .

28. (Previously Presented) The solid catalyst component according to claim 50, wherein the solid catalyst component has a pore volume ranging from 0.1 to 1.0 ml/g .

29. (Currently Amended) The solid catalyst component according to claim 50, wherein the magnesium is present in an amount ~~ranging from 0.003 to 0.03 g of magnesium per g of solid catalyst component~~, of 0.3 to 3.0 % by weight, based on the weight of the catalyst.

30. (Currently Amended) The solid catalyst component according to claim 50, wherein the titanium is present in an amount ~~ranging from 0.005 to 0.02~~

~~g of titanium per g of solid catalyst component, of 0.5 to 2% by weight, based on the weight of the catalyst.~~

31. (Previously Presented) The solid catalyst component according to claim 50, wherein the organometallic compound of the groups 1, 2, 12 or 13 of the periodic table is present in an amount ranging from 0.003 to 0.03 g of metal per g of solid catalyst component.

32. (Previously Presented) The solid catalyst component according to claim 50, wherein the organometallic compound of the groups 1, 2, 12 or 13 of the periodic table is selected from a group consisting of an organo-aluminum, an organo-magnesium, an organo-lithium and an organo-zinc compound.

33. (Previously Presented) The solid catalyst component according to claim 50, wherein the alkoxy groups are present in an amount ranging from 0.03 to 0.08 g of alkoxy groups per g of solid catalyst component.

34. (Previously Presented) The solid catalyst component according to claim 50, wherein the alkoxy groups are selected from the group consisting of n-propoxy, i-propoxy, n-butoxy or i-butoxy.

35. (Currently Amended) The solid catalyst component according to claim 50, wherein the chlorine is present in an amount ~~ranging from 0.05 to 0.12 g~~

~~of chlorine atoms per g of solid catalyst component.~~ of 5 to 12% by weight, based on the weight of the catalyst.

Claim 36 (Cancelled)

37. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 51, wherein said process is carried out in a gas phase.

38. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 51, wherein the catalyst used in the polymerization process is an alkyl aluminum.

39. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 51, wherein the catalyst used in the polymerization process is trimethyl aluminum or triethyl aluminum.

40. (Previously Presented) The process for polymerization and copolymerization of ethylene according to claim 51, wherein the mass ratio co-catalyst:catalyst in the polymerization process is between 0.5:1 and 6:1.

41. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 51, wherein the catalyst is fed into a polymerization reactor as a dry bulk powder, as a paste, as an oil suspension or as a solvent suspension.

42. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 41, wherein the catalyst is fed directly into a polymerization reactor.

43. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 41, wherein the catalyst is prepolymerized before being fed into a polymerization reactor.

44. (Previously Presented) The process for the polymerization and copolymerization of ethylene according to claim 41, wherein the catalyst is prepolymerized with ethylene or propylene before being fed into a polymerization reactor.

45. (Previously Presented) A linear low density polyethylene produced according to claim 51.

46. (Previously Presented) A linear medium density polyethylene produced according to the process of claim 51.

47. (Previously Presented) A high density polyethylene produced according to the process of claim 51.

48. (Currently Amended) A process for producing a solid catalyst component used in the polymerization or copolymerization of ethylene which is substantially free of polar solvents which comprises:

(a) impregnating an activated particulate silica with a solution of an organometallic compound of the group 1, 2, 12 or 13 of the Periodic Table in an inert organic solvent;

(b) removing an impregnated liquid from step (a);

(c) preparing a solution by reacting at least one magnesium compound selected from the group consisting of magnesium chloride and magnesium alkoxides with at least one titanium compound selected from the group consisting of titanium alkoxides and titanium chlorine alkoxides;

(d) impregnating the silica obtained in (b) using the solution prepared in (c), ~~said solutions containing the magnesium compound in an amount of from 0.0024 to 0.24 g of magnesium per g of silica and the titanium compound in an amount of from 0.01 to 1 g of titanium per g of silica;~~ silica containing magnesium in an amount of 0.3 to 3.0 % by weight and titanium in an amount of 0.5 to 2.0 % by weight, based on the weight of the catalyst;

(e) optionally reacting the impregnated solid obtained in (d) with a reducing agent in an amount of from 0 to 2 moles per mole of titanium; and

(f) reacting the impregnated solid produced in (d) or (e) with a chlorine containing agent ~~in an amount of from 0.5 to 3 moles of chlorine containing agent~~

per mole of titanium; to produce a chlorine content in an amount of 5 to 12 % by weight, based on the weight of the catalyst;

(g) thermally treating the impregnated solid produced in (f);

(h) washing the thermally treated solid produced in (g) with an inert organic solid; and

(i) optionally washing the solid produced in (h) with a solution of one or more organometallic compounds of groups 1, 2, 12 or 13 of the Periodic Table.

49. (Previously Presented) The process of claim 48 wherein the activated particulate silica is produced by heating silica in an inert atmosphere at a temperature of 100 to 750°C and for a period such that the amount of OH remaining on the silica surface after this treatment ranges from 0.1 to 2 mmoles OH per g of silica.

50. (Previously Presented) A solid catalyst component used in the polymerization or copolymerization of ethylene produced by the process of claim 48.

51. (Currently Amended) A process for the polymerization or copolymerization of ethylene which comprises conducting the polymerization or copolymerization in the presence of ~~an~~ the activated particulate silica catalyst produced by the process of claim 48.

52. (New) A catalyst composition which is substantially free of polar solvent which comprises:

an activated particulate silica carrier, impregnated with an organic metallic compound and catalytic active components including magnesium, titanium and chlorine, wherein, based on the weight of the catalyst, titanium is present in an amount of 0.5 to 2 % by weight, magnesium is present in an amount of 0.3 to 3.0 % by weight and chlorine is present in an amount of 5 to 12% by weight.

53. (New) The catalyst composition of claim 52, wherein magnesium is obtained from magnesium chloride or magnesium alkoxides.

54. (New) The catalyst composition of claim 52, wherein the titanium is obtained from titanium alkoxides or titanium chlorine alkoxides.

55. (New) The catalyst composition of claim 52, wherein the chlorine is obtained from a chlorine-containing agent.

56. (New) The catalyst composition of claim 52, wherein the magnesium is present in an amount of 0.3 to 1.5 % by weight.

57. (New) The catalyst composition of claim 52, wherein the chlorine is present in an amount of 5 to 10.8 % by weight.

58. (New) A catalyst composition used for the polymerization and copolymerization of olefins which comprises

an activated particulate silica carrier, impregnated with an organic metallic compound and catalytic active components including magnesium, titanium and chlorine, wherein, based on the weight of the catalyst, titanium is present in an amount of 0.5 to 2 % by weight, magnesium is present in an amount of 0.3 to 3.0 % by weight and chlorine is present in an amount of 5 to 12% by weight.

59. (New) The catalyst composition of claim 58, wherein the resulting polyolefin is HDPE and LDPE.

60. (New) A process for the polymerization or copolymerization of ethylene which comprises conducting the polymerization or copolymerization in the presence of the activated particulate silica catalyst of claim 52.

61. (New) A process for producing a solid catalyst component used in the polymerization or copolymerization of ethylene and which is substantially free of polar solvents, which comprises:

(a) impregnating an activated particulate silica with a solution of an organometallic compound of the group 1, 2, 12 or 13 of the Periodic Table in an inert organic solvent; and

(b) further impregnating the silica with at least one magnesium component selected from the group consisting of magnesium chloride and magnesium alkoxide, at least one titanium component selected from the group consisting of titanium alkoxides and titanium alkomine alkoxides and a chlorine-containing agent to obtain silica with a magnesium content of 0.3 to 2.0 % by weight, a titanium content of 0.5 to 2.0 % by weight and a chlorine content of an amount of 5 to 12 % by weight, based on the weight of the catalyst.